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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/642,439	08/14/2003	John H. Brophy	02-024	2458
34833	7590	07/07/2005	EXAMINER	
FRANK ROSENBERG 18 ECHO HILL LANE MORAGA, CA 94556			PASTERCZYK, JAMES W	
			ART UNIT	PAPER NUMBER
			1755	

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/642,439

Applicant(s)

BROPHY ET AL.

Examiner

J. Pasterczyk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-9,11,24,28,32 and 34-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-9,11,24,28,32 and 34-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 August 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/13, 4/23, 4/25/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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1. This Office action is in response to the amendment and election of 4/25/05 and the IDS documents filed 4/25/05, 4/23/05 and 5/13/05.

2. The drawings are objected to because the matter found in figures 3-5 is rather small and difficult to read, hence larger drawings with distinct dark lines on separate sheets should be furnished for these three figures. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. Claims 3, 5-9, 32, 36 and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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In claim 3, delete “the system comprises a tethered catalyst composition, and” as prolix with the independent claim, and “defines” may be better termed --is disposed within-- or --is attached to--.

In claims 5 and 6 it is not clear what is meant by a “porous insert”; is there some sort of separate monolith of a porous material that can be inserted and removed at will from the microchannel or the reactor?

In claim 6 insert --to-- after each instance of “adjacent”.

In claims 7 and 9 most of the support materials and catalysts require an indefinite article before them.

In claim 8 “surface oxygen” lacks antecedent basis.

In claim 32 change “comprises” to --comprising--, and it is not clear what is meant by a “dendritic catalyst”; is the catalyst itself of dendritic form, or does it produce chemical products of dendritic form?

In the first claim 36 it is not clear what is meant by “based”; perhaps --comprising-- would be better word choice here. It is also not clear whether an actual metallurgical alloy is meant in which iron exists as a solid solution with another element; instead, it seems as if iron atoms or aggregates are meant. There is also a second claim 36, contrary to rule 126. Applicants are advised to renumber the succeeding claims in accordance with this provision of the MPEP in order to make the dependent claims have clear limitations from within their superior claims.

In claim 40, after “claim 1” insert --wherein said tethered catalyst composition comprises-- and delete “comprising”. In the second compound R is left undefined.

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 5, 7-9, 24 and 28 are rejected under 35 U.S.C. 103(a) as being obvious over Dai et al., USP 6,251,280 (hereafter referred to as Dai) in view of Greenway et al., "Sensors and Actuators B, vol. 63, pp. 153-158) (2000) (hereafter referred to as Greenway).

As the examiner understands the term, a "tethered chiral auxiliary" is a moiety that aids in the resolution of enantiomers of mixtures of chiral compounds. In that case, Dai discloses the invention substantially as claimed (abstract "separation of substances using chromatography", "high selectivity", "molecular recognition"; figures; col. 3, l. 18-20; col. 8, l. 4-14; col. 9, l. 27-30; col. 11, l. 45-49). One of ordinary skill in the art would have recognized that the combination of disclosures on "improved stereochemical specificity" and chromatography would have led to the logical conclusion that separation of stereochemical enantiomers would have been possible with the compositions of Dai.

Dai lacks disclosure that the separations could have been performed in a microreactor.

However, Greenway teaches that in chemical technology on the nanoscale the use of microreactors having microchannels is a conventional technique (abstract).

It would have been obvious to one of ordinary skill in the art to apply the teaching of Greenway to the disclosure of Dai with a reasonable expectation of obtaining a highly-useful catalyst system with the expected benefit of greater control of spatial and temporal conditions, including thermal control.

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6. Claims 1, 3, 5, 7-9, 24, 32, 34, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gyraznov et al., USP 4,394,294 (hereafter referred to as Gyraznov) in view of Greenway cited supra.

Gyraznov discloses a transition metal catalyst bonded to a silica surface via an organic group having a terminal Lewis basic site (abstract; col. 3, l. 6-35). One of ordinary skill in the art would further have recognized that the silica of Gyraznov would have been porous and that the tethered catalysts could have been disposed within the pores of said porous silica.

Gyraznov lacks disclosure that such catalysts may be disposed in the channels of a microreactor.

However, Greenway teaches that in chemical technology on the nanoscale the use of microreactors having microchannels is a conventional technique to perform catalyzed chemical reactions (abstract).

It would have been obvious to one of ordinary skill in the art to apply the teaching of Greenway to the disclosure of Gyraznov with a reasonable expectation of obtaining a highly-useful catalyst system with the expected benefit of greater control of spatial, temporal, and thermal conditions under which the reaction took place.

7. Claims 4, 6, 11 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gyraznov in view of Greenway as applied to claims 1, 3, 5, 7-9, 24, 34, 39 and 40 above, and further in view of Gavriilidis et al., Trans. IChemE., vol. 80, part A. pp. 3-30 (January 2002) (hereafter referred to as Gavriilidis).

The disclosures of Gyraznov and Greenway have been discussed above.

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Neither Gyraznov nor Greenway discloses or teaches the use of micromixers or cooling channels in the reactions performed or the reactors disclosed therein.

However, Gavriilidis teaches that in microreactors it is conventional to include micromixers upstream in the reactant flow (fig. 3) and that heat exchangers are also conventional in such microreactors having channels (fig. 11 b).

It would have been obvious to one of ordinary skill in the art to apply the teaching of Gavriilidis to the disclosures of Gyraznov and Greenway with a reasonable expectation of obtaining a highly-useful chemical microreactor with the expected benefit of greater conversion of reactants due to their mixing before entering the reaction zone as well as greater control of the kinetics of the reaction by controlling the reaction temperature via what are essentially microcondensers to cool or heat as necessary the reaction zone.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Pasterczyk whose telephone number is 571-272-1375. The examiner can normally be reached on M-F from 9 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo, can be reached at 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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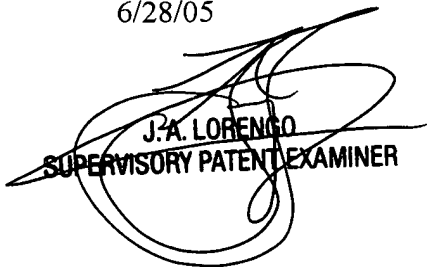
system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



J. Pasterczyk

AU 1755

6/28/05



J.A. LORENCO
SUPERVISORY PATENT EXAMINER